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EXAMINER	
RASHID, DAVID	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/802,570	DAMERA-VENKATA, NIRANJAN	
	Examiner	Art Unit	
	David P. Rashid	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

All of the examiner's suggestions presented herein below have been assumed for examination purposes, unless otherwise noted.

Amendments

1. This office action is responsive to the claim and specification amendment received on 5/15/2007. Claims 1 – 23 are pending.

Drawings

2. The replacement drawings were received on 5/15/2007 and are acceptable. In response to applicant's drawing amendments and remarks, the previous drawing objections are withdrawn.

Specification

3. In response to applicant's specification amendments and remarks received on 5/15/2007, the previous specification objections are withdrawn.

Claim Objections

4. In response to applicant's claim objections amendments and remarks received on 5/15/2007, the previous claim objections are withdrawn. It is to be clarified that claims 15 and 16 were objected to in the last Office Action because they depend from claim 14 which contained the objection.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. **Claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 19, 20, 21** and **22** are rejected under 35 U.S.C. 102(b) as being anticipated by Higuchi et al. (US 5708514 A).

Regarding **claim 1**, Higuchi discloses a method of generating a halftone image ("It is an object of the present invention to provide an image recording apparatus capable of stably recording a good tone image for a general image recording apparatus which records an image in a multi-level manner.", column 3, line 58. More specifically, the examiner is concerned with the fourth embodiment of the invention - FIG. 34 through FIG. 40 and column 24 through column 27.) comprised of a plurality of pixels ("For example, the recording control signals (exposure pulses) of pixels around the current pixel have the distributions shown in FIGS. 35A and 35B, light distributions on the photoreceptor drum 24 shown in FIGS. 36A and 36B are obtained.", column 24, line 50), each pixel further comprised of two or more sub-pixels (The fourth embodiment of the invention defines the sub-pixels as "pulse width" in direct correlation to exposure time, "...recording width information=pulse width...", column 25, line 54. The

number of total sub-pixels can then be considered dependent on the resolution of the pulse width.), the method comprising:

a. Generating a lookup table providing allowable sub-pixel exposure configurations (TABLE 1, column 26 in combination with FIG. 39 has been "generated" at some point in time.);

b. Processing the pixels in a sequential order using an error diffusion technique ("When the error signal is input to an error diffusion section 8, error diffusion is performed for an image signal from the image input section 1.", column 24, line 37 (FIG. 34) in addition to "Referring to FIGS. 39A to 39P, as in FIG. 37, a lateral direction indicates a main scanning direction, and a vertical direction indicates a sub-scanning direction, each lower right pixel indicates the current pixel X having a recording control signal to be determined, and the upper and left pixels of each current pixel X respectively indicate the adjacent pixels A and B to be referred to.", column 25, line 57.);

c. Selecting from the lookup table an allowable sub-pixel exposure configuration for each pixel as it is processed (TABLE 1, column 26 in combination with FIG. 39 that has been applied.); and

d. Applying an exposure difference (FIG. 34, element 6) computed based on a difference between a modified input value (left side of element 6 in FIG. 34 from the adder 2 (that added image input section 1 and error diffusion section 8) to create a modified input value) and the selected allowable sub-pixel exposure configuration to subsequent pixels (right side of element 6 in FIG. 34 from recording density estimate section 9; Col. 17, line 66 – Col. 18, line 11).

Regarding **claim 2**, Higuchi discloses the method of claim 1 whereby the lookup table providing allowable exposure configurations is indexed based on at least one exposure characteristic of at least one pixel currently being processed (TABLE 1, column 26 contains Pixel B and Pixel A columns, wherein pixel A and B are neighboring pixels as shown in FIG. 39A).

Regarding **claim 3**, Higuchi discloses the method of claim 2 wherein each neighboring pixel, used in selecting from the lookup table, has already been processed (FIG. 37 discloses the main scanning direction wherein the shaded area has already been processed before reaching the current pixel. "Referring to FIGS. 39A to 39P, as in FIG. 37, a lateral direction indicates a main scanning direction, and a vertical direction indicates a sub-scanning direction, each lower right pixel indicates the current pixel X having a recording control signal to be determined, and the upper and left pixels of each current pixel X respectively indicate the adjacent pixels A and B to be referred to.", column 25, line 57.).

Regarding **claim 4**, Higuchi discloses the method of claim 3, wherein each neighboring pixel is adjacent to the pixel currently being processed (refer to reference cited in claim 3).

Regarding **claim 5**, Higuchi discloses the method of claim 1, whereby the allowable exposure configurations provided by the lookup table each comprises a justification value and an exposure level (TABLE 1, column 26 contains two sub-columns for each adjacent neighboring pixel from the target pixel wherein the pulse width may be considered exposure level, and the pulse position may be considered the justification value. Refer to FIG. 39 for all possible visual orientations that reflect TABLE 1.).

Regarding **claim 6**, Higuchi discloses the method of claim 5 wherein the justification values and exposure levels are provided by the lookup table are consequent to sub-pixel capabilities of an output device for which the halftone image is generated (It is another object of the present invention to provide an image recording apparatus capable of recording a good tone image having high resolution and a low noise level and being free from a change in density and a coarse portion in a low-density area while using a recording system which is not suitable for multi-level recording." , column 3, line 62.).

Regarding **claim 7**, Higuchi discloses the method of claim 5 whereby the justification value of an allowable exposure configuration is either left of right (TABLE 1, column 26 shows the pulse position (justification value) as either "front" (left) or "rear" (right). One ordinary skilled in the art understands that "right" or "left" is another way of broadly stating a bi-directional configuration of the allowable exposure justification value, whether "right" or "left" be "top" or "bottom", "front" or "rear", "forward" or "backward", etc.)

Regarding **claim 8**, Higuchi discloses the method of claim 5 wherein the step of selecting further comprises setting the justification and applying a tone associated with the exposure level of the selected allowable exposure configuration ("For example, the recording control signals (exposure pulses) of pixels around the current pixel have the distributions shown in FIGS. 35A and 35B, light distributions on the photoreceptor drum 24 shown in FIGS. 36A and 36B are obtained. When a potential distribution and a toner amount distribution are calculated by the distributions shown in FIGS. 36A and 36B, the recording density can be estimated. Since the relationship between an exposure and an amount of toner to be developed has nonlinear characteristics as shown in FIG. 6. For this reason, even if the same exposure pulse width having

a duty ratio of 50% is used as in FIGS. 35A and 35B, when exposure pulse start times are different from each other, different recording densities may be obtained.", column 24, line 50 in combination with "This embodiment is characterized in that the image dots of a recording image are controlled in size. The image dot means connected areas which toner adheres on the photoreceptor drum 24. As described above, when an exposure pulse width is small, an area having an intermediate potential increases on the photoreceptor drum 24, density stability is degraded, or coarse noise increases.", column 24, line 64.).

Regarding **claim 9**, Higuchi discloses the method of claim 8 whereby the exposure level setting for at least one of the allowable exposure configurations corresponds to no tone being applied (According the references cited in claim 8, the toner and exposure level reflects the values from those calculated in TABLE 1, column 26. TABLE 1, column 26 does disclose the possibility that the current pixel after the algorithm can still contain no image dot. In this case, pixel A and B would have no image dot, and the current pixel value T = 0. After the algorithm, the current pixel value would still be 0, and no image dot would result.).

Regarding **claim 10**, Higuchi discloses the method of claim 1 wherein, for the pixel currently being processed, the step of selecting from the lookup table is based on

(i) an exposure characteristic of one or more neighboring pixels (TABLE 1, column 26 wherein the exposure characteristic is pulse width of both adjacent and neighboring pixels A and B) and

(ii) a modified input value for the pixel currently being processed ("FIG. 34 is a block diagram showing the arrangement of an image recording apparatus according to the fourth

embodiment.", column 24, line 12. FIG. 34 discloses an error diffusion section wherein a weight is redirected back into the image input section to "modify" the pixel to be processed.)

Regarding **claim 11**, Higuchi discloses the method of claim 10 wherein the step of selecting an allowable exposure configuration further comprises comparing the modified input value for the current pixel with allowable exposure configurations provided by the lookup table (More detail is given in the first embodiment of the invention for a similar setup to that of the fourth embodiment's FIG. 34: "Referring to FIG. 2, an image input section 1 (e.g., a scanner or an image memory) outputs an image signal of an half-tone image, i.e., outputs an image signal where each pixel has a multi-level pixel density value. This image signal is input to an adder 2. The adder 2 adds a correction density value to each pixel density value to output corrected pixel density values.", column 8, line 66 as well as "The error diffusion section 8 includes an error buffer 8a for temporarily storing the error signal and a weighting section 8b for multiplying the error signal read from the error buffer 8a by a predetermined weighting coefficient. The error diffusion section 8 supplies a result obtained by multiplying the error signal by the weighting coefficient to the adder 2 to perform error diffusion for an image signal from the image input section 1.", column 13, line 29.

With the above references, it is inherent that the values of the current pixel T of the fourth embodiment have incorporated weights due to the error diffusion section.).

Regarding **claim 12**, Higuchi discloses a method of generating a halftone image for an output device ("It is an object of the present invention to provide an image recording apparatus capable of stably recording a good tone image for a general image recording apparatus which records an image in a multi-level manner.", column 3, line 58. More specifically, the examiner

is concerned with the fourth embodiment of the invention - FIG. 34 through FIG. 40 and column 24 through column 27.) using error diffusion to process a plurality of pixels in a sequential order (refer to references cited in claim 1), said output device having sub-pixel addressability (TABLE 1, column 26), the method comprising:

a. Creating a lookup table indicating one or more allowable exposure configurations for a currently processed pixel based on exposure characteristics of one or more pixels neighboring said current pixel (refer to references cited in claim 1);

b. Accessing the lookup table for the current pixel ("As shown in Table 1, the recording control signal of the current pixel X is determined by the recording control signals of pixels A and B adjacent to the current pixel X. Table 1 shows the recording control signal of the current pixel X for 16 combinations of the recording control signals (recording width information=pulse width and recording position information=pulse position) of the adjacent pixels A and B. The 16 recording patterns corresponding to the Table 1 are shown in FIGS. 39A to 39P.", column 25, line 49.);

c. Identifying the allowable exposure configurations for the current pixel (TABLE 1, column 26 depicts a third column wherein the current pixel is evaluated, including the identification of the allowable exposure configurations under the pulse width Tx sub-column);

d. Selecting an allowable exposure configuration for the current pixel (The allowable selection exposure configuration for the current pixel is given in TABLE 1, column 26 under the pulse width Tx sub-column.); and

e. Applying the selected allowable exposure configuration to the current pixel ("The hatched portions in the adjacent pixels A and B indicate the recording width information and

recording position information of the recording control signal of the current pixel X.", column 25, line 64.); and

f. Applying an exposure difference (FIG. 34, element 6) computed based on a difference between a modified input value (left side of element 6 in FIG. 34 from the adder 2 (that added image input section 1 and error diffusion section 8) to create a modified input value) and the selected allowable sub-pixel exposure configuration to subsequent pixels (right side of element 6 in FIG. 34 from recording density estimate section 9; Col. 17, line 66 – Col. 18, line 11).

It must be noted that the following example for the fourth embodiment disclosed by Higuchi carries out all sub-section (a) through (e) of claim 10: " FIG. 40B shows a case wherein the pixel B adjacent to the current pixel X on the left side has an image dot and the pixel A adjacent to the current pixel X on the upper side has no image dot, and the provisional value of the pulse width of the current pixel X is 0.5. In this case, according to condition 5, the recording control signal of the current pixel X has an upper exposure pulse position and an exposure pulse width of 0.5. Therefore, the image dot of the current pixel X is connected to the image dot of the adjacent pixel on the left side, and the image dot is prevented from being isolated.", column 27, line 20.

Regarding **claim 13**, Higuchi discloses the method of claim 12 whereby said one or more neighboring pixels are comprised of pixels adjacent to the current pixel (refer to references cited in claim 4).

Regarding **claim 14**, Higuchi discloses method of claim 12 wherein the step of selecting the allowable exposure configuration further comprises comparing a modified input value for the

current pixel with allowable exposure configuration provided by the lookup table (refer to references cited in claim 10).

Regarding **claim 17**, Higuchi discloses the method of claim 12 wherein each allowable exposure configuration is comprised of a justification and an exposure level setting, said justification and exposure settings being consequent to capabilities of the output device and the sub-pixel addressability (refer to the references cited in claims 5 and 6).

Regarding **claim 18**, Higuchi discloses the method of claim 17 wherein the step of applying further comprises the steps of setting the justification and applying the exposure level (Refer to the "reference example" given in claim 12 in combination with the algorithm given in FIG. 34. TABLE 1, column 26 and the current pixel column indicated the setting of the justification (pulse position) and applying of the exposure level (pulse width Tx) to each upcoming current pixel.).

Regarding **claim 19**, Higuchi discloses the method of claim 17 whereby the justification setting of an allowable exposure configuration is either left or right (refer to references cited in claim 7).

Regarding **claim 20**, Higuchi discloses the method of claim 17 whereby the exposure level setting for at least one of the allowable exposure configurations corresponds to the application of no tone (refer to references cited in claim 9).

Regarding **claim 21**, Higuchi discloses a method of processing an image ("An image recording apparatus according to the present invention... and error diffusion means for diffusing an error between the pixel density value and a recording density value of the second recording control signal...", column 4, line 1.) comprising:

a. Generating a lookup table (TABLE 1, column 26)

i. indexed by possible exposure characteristics of at least one neighboring pixel to a current pixel ("As shown in Table 1, the recording control signal of the current pixel X is determined by the recording control signals of pixels A and B adjacent to the current pixel X. Table 1 shows the recording control signal of the current pixel X for 16 combinations of the recording control signals (recording width information=pulse width and recording position information=pulse position) of the adjacent pixels A and B. The 16 recording patterns corresponding to the Table 1 are shown in FIGS. 39A to 39P.", column 25, line 49.), and

ii. indicating allowable exposure configurations for the current pixel, each allowable exposure configuration comprised of a justification value and an exposure value (refer to references cited in claim 5);

b. As each pixel is processed as the current pixel using the error diffusion technique

i. Determining the exposure characteristics of one or more neighboring pixels which have been processed previous to the current pixel (refer to references cited in claims 1, 2, and 3);

ii. Calculating a modified input value for the current pixel (refer to references cited in claim 10);

iii. Referring to the lookup table based on the exposure characteristics of at least one pixel neighboring the current pixel to identify allowable exposure configurations for the current pixel (refer to references cited in claim 11);

iv. Selecting from the allowable exposure configurations by comparing the modified input value for the current pixel with an exposure level associated with each allowable exposure configuration (Refer to references cited in claim 8. Since there is only one allowable pulse width Tx for each new current pixel, that particular allowable pulse width Tx will be "selected" with a "self-comparison".); and

v. Applying the selected allowable exposure by setting the justification for the current pixel and applying the tone associated with the exposure level (refer to references cited in claim 8).

vi. Applying an exposure difference (FIG. 34, element 6) computed based on a difference between a modified input value (left side of element 6 in FIG. 34 from the adder 2 (that added image input section 1 and error diffusion section 8) to create a modified input value) and the selected allowable sub-pixel exposure configuration to subsequent pixels (right side of element 6 in FIG. 34 from recording density estimate section 9; Col. 17, line 66 – Col. 18, line 11).

Regarding **claim 22**, Higuchi discloses the method of claim 32 wherein said neighboring pixels are adjacent to the current pixel (refer to references cited in claim 4).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. **Claims 15, 16,** and **23** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination between Higuchi et al. (US 5708514 A) "fourth embodiment" and Higuchi et al. (US 5708514 A) "first embodiment".

Regarding **claim 15**, while Higuchi "fourth embodiment" discloses the method of claim 14, Higuchi "fourth embodiment" does not disclose wherein the step of comparing a modified input value to select an allowable exposure configurations comprises identifying an exposure configuration having an exposure level closest to said modified input value.

Higuchi "first embodiment" discloses wherein the step of comparing a modified input value to select an allowable exposure configuration comprises identifying an exposure configuration having an exposure level closest to said modified input value ("In conversion of the first recording control signal into the second recording control signal, the value of a recording control signal which is closest to the value of the first recording control signal and can be stably recorded is selected. The reason why the value closest to the value of the first recording control signal is to obtain faithful tone reproduction by minimizing error between the input pixel density value and the recording density value for the current pixel. When instability in a recording system changes, a recording control signal capable of usually obtaining stable pixel formation is selected in consideration of an allowable range of change.", column 12, line 14.).

It would have been obvious to one ordinary skilled in the art at the time the invention was made for the "fourth embodiment" of Higuchi to include wherein the step of comparing a modified input value to select an allowable exposure configuration comprises identifying an exposure configuration having an exposure level closest to said modified input value as taught by

Higuchi "first embodiment" "...to obtain faithful tone reproduction by minimizing error...", column 12, line 19.

Regarding **claim 16**, while Higuchi "fourth embodiment" discloses the method of claim 14, Higuchi "fourth embodiment" does not disclose further comprising the step of differencing the modified input value of the current pixel and applied exposure to generate a present error value to be propagated forward in the error diffusion processing.

Higuchi "first embodiment" discloses further comprising the step of differencing the modified input value of the current pixel and applied exposure to generate a present error value to be propagated forward in the error diffusion processing ("In this case, even if a value different from that of the original first recording control signal is selected, the second recording control signal serving as a final output is diffused to other pixels through the error diffusion section 8 using the difference between the recording density value and the input pixel density value as an error. For this reason, macroscopic density of the input pixel is maintained.", column 12, line 40.).

It would have been obvious to one ordinary skilled in the art at the time the invention was made for the "fourth embodiment" of Higuchi to include further comprising the step of differencing the modified input value of the current pixel and applied exposure to generate a present error value to be propagated forward in the error diffusion processing as taught by Higuchi "first embodiment" so that "...macroscopic density of the input pixel is maintained.", column 12, line 45.

Regarding **claim 23**, while Higuchi "fourth embodiment" discloses the method of claim 21, Higuchi "fourth embodiment" does not disclose wherein the step of comparing a modified

input value of the current pixel to select an allowable exposure configuration comprises identifying an exposure configuration having an exposure level closest to said modified input value of the current pixel.

Higuchi "first embodiment" discloses wherein the step of comparing a modified input value to select an allowable exposure configuration comprises identifying an exposure configuration having an exposure level closest to said modified input value of the current pixel ("In conversion of the first recording control signal into the second recording control signal, the value of a recording control signal which is closest to the value of the first recording control signal and can be stably recorded is selected. The reason why the value closest to the value of the first recording control signal is to obtain faithful tone reproduction by minimizing error between the input pixel density value and the recording density value for the current pixel. When instability in a recording system changes, a recording control signal capable of usually obtaining stable pixel formation is selected in consideration of an allowable range of change.", column 12, line 14.).

It would have been obvious to one ordinary skilled in the art at the time the invention was made for the "fourth embodiment" of Higuchi to include wherein the step of comparing a modified input value to select an allowable exposure configuration comprises identifying an exposure configuration having an exposure level closest to said modified input value of the current pixel as taught by Higuchi "first embodiment" "...to obtain faithful tone reproduction by minimizing error...", column 12, line 19.

Response to Arguments

9. Applicant's arguments filed on 5/15/07 have been fully considered but they are not persuasive.

Applicant's arguments regarding **claims 1, 12,** and **21 as amended** have been respectfully and fully considered, and though found persuasive, an adjusted and more specific anticipation by Higuchi has been established over the amended claims. Applicant argues that by amending the claims to include the aspect of "Applying an exposure difference computed based on a difference between the modified input value and the allowable exposure configuration to subsequent pixels", the Higuchi design does not apply such an exposure difference not even compute such a difference, and though the Applicant disagrees with other reasoning presented, the amendment to include the "pushing forward" aspect clearly differentiates the claims from Higuchi (i.e., refer to response page 13, bottom paragraph).

However, error diffusion is the main objective of Higuchi as reflected in the error diffusion section 8 in all embodiments including the fourth as disclosed in FIG. 34. A direct comparison of FIG. 1B of the examined application and FIG. 34 of Higuchi shows a close correlation of elements, including an exposure difference (FIG. 34, element 6) computed based on a difference between a modified input value (left side of element 6 in FIG. 34 from the adder 2 (that added image input section 1 and error diffusion section 8) to create a modified input value) and the selected allowable sub-pixel exposure configuration to subsequent pixels (right side of element 6 in FIG. 34 from recording density estimate section 9; Col. 17, line 66 – Col. 18, line 11). Independent claims 1, 12, and 21 along with their respective dependent claims are not in condition for allowance and are obvious in view of Higuchi.

Applicant's arguments with respect to independent **claims 15, 16,** and **22** have been respectfully and fully considered, and are not found persuasive. Applicant argues that it is unclear what modification is being suggested here to the Higuchi reference since according to MPEP 706.02, "in a rejection based on 35 U.S.C. 103, the reference teachings must somehow be modified in order to meet the claims." However, multiple embodiments within a disclosure are different and distinguishable alterations of each other, thus making them separate embodiments. Since they are distinguishable, the difference between one embodiment and another would be a modification of one to equal the other allowing 35 U.S.C. 103 to be used as if each embodiment were in a separate disclosure altogether.

Applicant also argues that the dependent claims 15, 16, and 23 now depend from an allowable base claim and thus include limitations not found in the cited reference. However, as shown in Section 9, the limitations added to the independent claims are found in the cited reference and thus the dependent claims are not non-obvious in view of the cited reference.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David P. Rashid whose telephone number is (571) 270-1578. The examiner can normally be reached Monday - Friday 8:30 - 17:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner can be reached on (571) 272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David P. Rashid/
Examiner, Art Unit 2624

David P Rashid
Examiner
Art Unit 2624

/Brian P. Werner/
Supervisory Patent Examiner (SPE), Art Unit 2624